

# momentum difference: $q < 0$ vs $q > 0$

Measured momentum at 58 GeV/c has a difference by 2 GeV/c depending from the beam polarity.

What calorimeters tells about?

How to look? Compare energy depositions from  $K^-$  and  $K^+$  using fixed energy coefficients for both cases

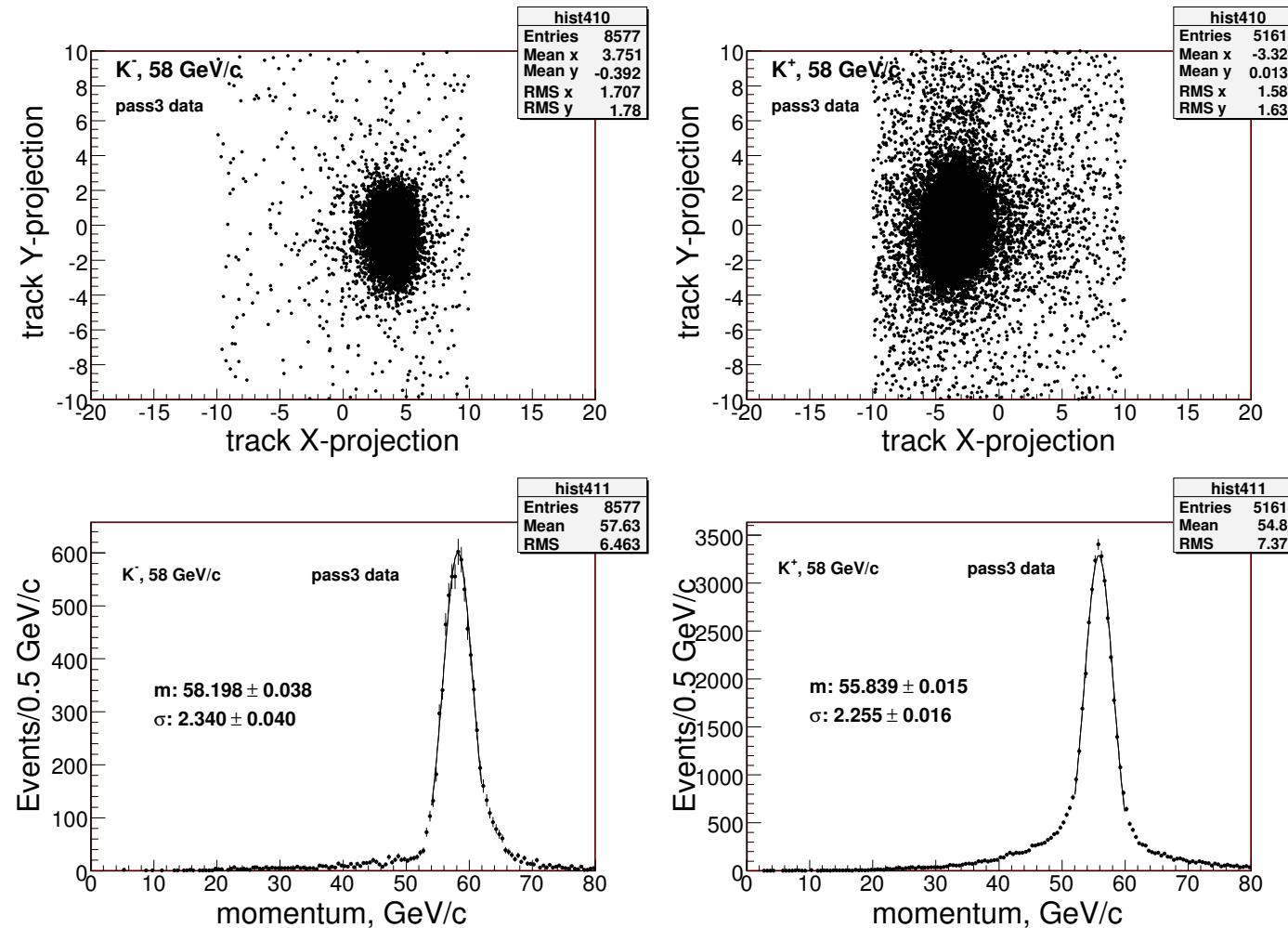
data: pass 3

target: thin, LH2, empty

Event/track selection cuts:

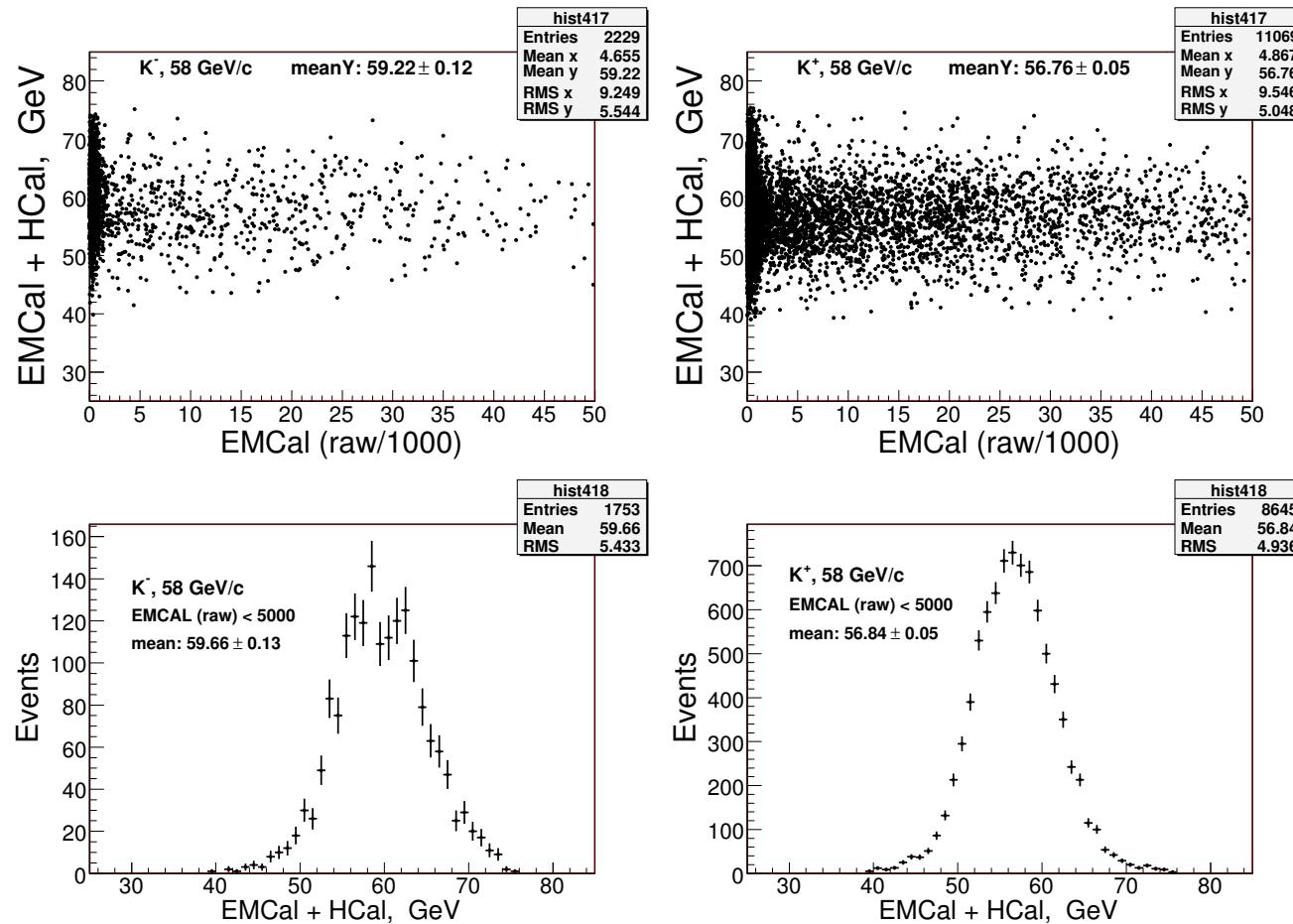
- $n_{TotalTrks} \leq 20$
- vertices are within the target sizes (X and Y)
- $20 < NTPCPoints < 95$
- $-10 < TrkTime < 50$  ns
- tracks with the DC4, PWC5 and PWC6 hits
- track projections at EMCAL area within 5 cm radius, center of beam spot is 4 cm away from the beam line
- only single track per event at HCAL aperture

# beam spot at HCAL, momentums



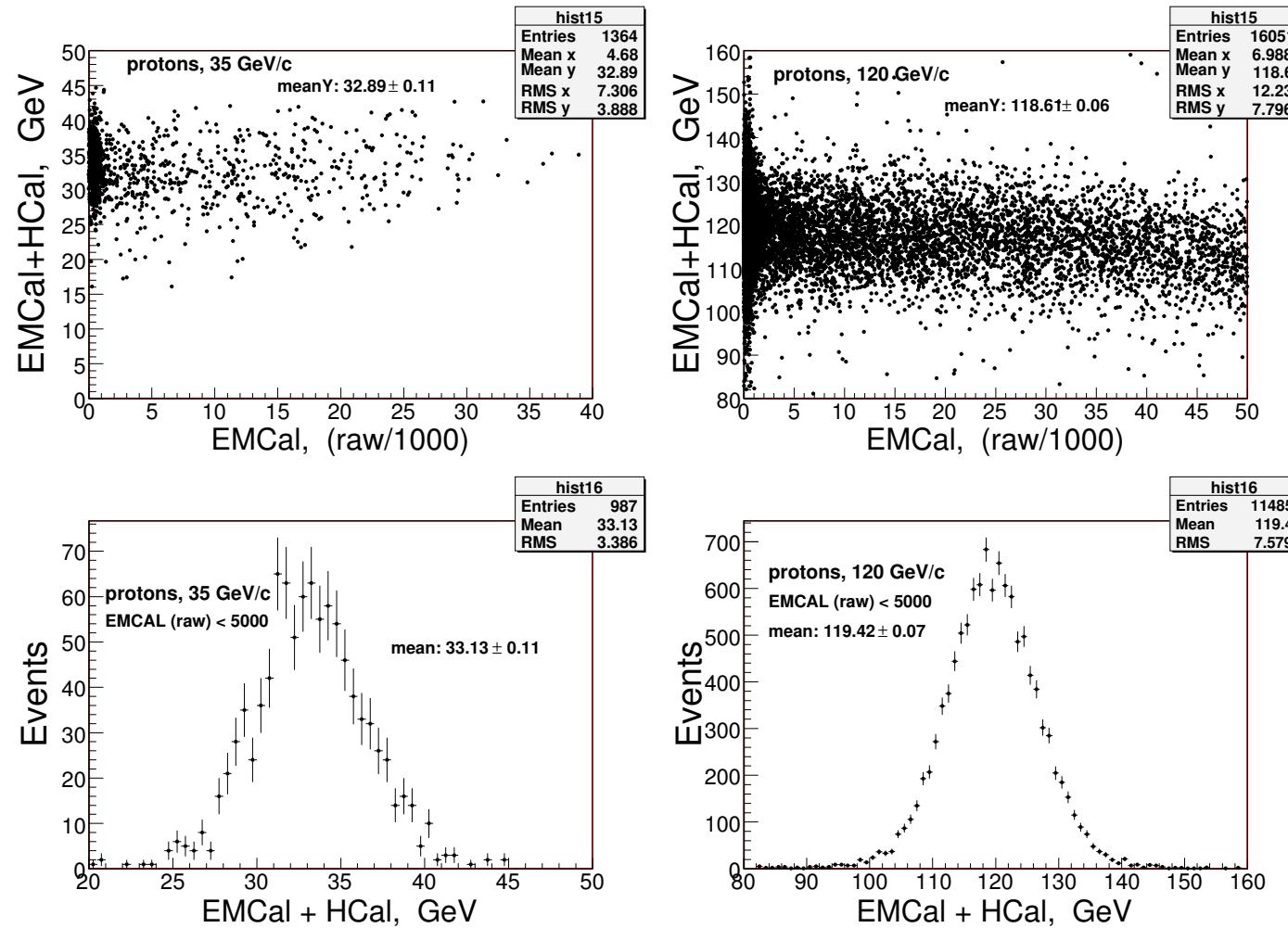
Top plots:  $K^-$  (on left) and  $K^+$  (on right) beam spots at HCAL.  $K^-$  located on the west side and  $K^+$  on - the east side of HCAL. Bottom plots: momentum distributions.

# energy deposition: $K^-$ vs $K^+$



Top plots: EMCAL+HCAL vs EMCAL on  $K^-$  (left) and  $K^+$  (right) beams with momentum cut within 1 GeV/c of the central value. Bottom plots - EMCAL+HCAL distributions. Energy depositions into EMCAL: <50000 counts for top and <5000 counts for bottom plots. Measured momentum of  $K^-$  beam:  $58.2 \pm 0.04$  GeV/c,  $K^+$  beam:  $55.8 \pm 0.02$  GeV/c

# 35 and 120 GeV/c protons



What calorimeters can tell on 35 GeV/c and 120 GeV/c protons? Top plots: EMCAL+HCAL vs EMCAL using 35 GeV/c (left) and 120 GeV/c (right) protons, plots made with EMCAL<50000 cut. Bottom plots - with EMCAL<5000 cut.